**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
NATIONAL VEHICLE AND FUEL EMISSIONS LABORATORY
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ANN ARBOR, MICHIGAN 48105-2498

OFFICE OF
AIR AND RADIATION

December 23, 2002 CCD-02-22 (AFC/LDV/LDT/MDV)

SUBJECT: ORVR Guidance for Manufacturers of Alternative Fuel Systems

Dear Manufacturer:

Attached is a guidance document for manufacturers of Liquified Petroleum Gas (LPG) and Compressed Natural Gas (CNG) alternative fuel systems. The letter describes new guidance on Onboard Refueling Vapor Recovery (ORVR) applications for manufacturers of LPG and CNG refueling systems on light duty vehicles. The letter also clarifies EPA's policy for granting waivers from Onboard Refueling Vapor Recovery (ORVR) testing for dual fueled vehicles modified by aftermarket alternative fuels converters.

This guidance is effective immediately, and applies to aftermarket converters and OEMs who manufacture dual fuel and dedicated alternative fueled vehicles.

If you have questions concerning this letter or the attachment, please contact Martin Reineman at 734-214-4430, or by e-mail at reineman.martin@epa.gov.

Sincerely,

Gregory A. Green, Director
Certification and Compliance Division
Office of Transportation and Air Quality

Attachment

**Attachment to Guidance Letter CCD-02-22**
**ORVR Guidance for Manufacturers of Alternative Fuel Systems**

Purpose:

This document provides new guidance on Onboard Refueling Vapor Recovery (ORVR) applications for manufacturers of Liquified Petroleum Gas (LPG) and Compressed Natural Gas (CNG) light duty vehicles. It also clarifies EPA's policy for granting waivers from ORVR testing for dual fueled vehicles modified by aftermarket alternative fuels converters.

Specifically, this letter describes information that should be included in the ORVR section of applications for certification from Original Equipment Manufacturers (OEMs) and aftermarket manufacturers who convert vehicles to dual fuel operation, or dedicated operation on LPG or CNG. The previous guidance for these vehicles as described in Enclosure I, items 1-7, of guidance letter VPCD-98-15, and CCD-00-10, did not specifically address the information needed from these manufacturers. This document provides that guidance. Additionally, this document clarifies that some LPG fueling systems may be considered to be closed fueling systems, thereby reducing the descriptive information previously requested in VPCD-98-15.

A second issue addressed in this letter is clarification that aftermarket converters may seek waivers from providing EPA refueling loss data when dual fueled vehicles are operated on gasoline. This guidance was not addressed in an earlier guidance letter clarifying EPA policies on aftermarket fuel conversions, CCD-02-12.

Background on ORVR Review of CNG and LPG Vehicles

The EPA final rule published in the April 6, 1994 Federal Register[1] described new regulations for controlling refueling emissions of light duty vehicles and trucks designed to operate on gasoline and the gaseous fuels CNG and LPG. (See for example 40 CFR 86.001-9(d) and 86.098-8(d)). Because safety of ORVR systems was of fundamental concern during the development of the regulation, section D of the April 6 final rule preamble discussed EPA's actions to ensure safe operation of the ORVR control system. Specifically, subsection 5 of section D stated "During review of the certification applications, EPA will study the design of the vehicle's ORVR system, its on-vehicle configuration and operation, and will consult directly with NHTSA on these applications."[2]

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[1]Federal Register Vol 59 No. 66 Wednesday, April 6, 1994, pages 16262 - 16309, Control of Air Pollution From New Motor Vehicles and New Motor Vehicle Engines; Refueling Emission Regulations for Light Duty Vehicles and Light Duty Trucks-Final Rule

[2]Federal Register Vol 59 No. 66 Wednesday, April 6, 1994 page 16275

An EPA final rule in the September 21, 1994 Federal Register[3] presented emission standards for gaseous fueled vehicles, including refueling loss standards for LPG light duty vehicles and trucks. Although LPG vehicles may be designed to have a closed fuel supply system, there was concern at the time the final rule was promulgated, and this concern remains today, that the "outage" valve may be open when the LPG tank is refueled. An open outage valve can serve as a means of ensuring that the fuel tank is not overfilled and therefore potentially release propane due to thermal expansion. The owners manuals of some current propane fueled vehicles recommend that the outage valve be open during vehicle refueling. For this reason EPA established a refueling standard for LPG vehicles. However, advances in the design of overfill prevention protection devices have progressed to the point where suppliers of propane fueled vehicles no longer find the use of the outage valve to be necessary for safe refueling of the vehicle.

The September 21, 1994 regulation did not include a refueling loss standard for CNG vehicles, but instead included an emission standard for CNG nozzle disconnection.

The authority for establishing EPA safety review of ORVR systems is derived from Sections 202(a)(4) and 206(a)(3) of the 1990 Clean Air Act Amendments, which provides EPA broad authority to address the safety of emission controls, and under this authority, EPA has issued three previous guidance letters, VPCD-97-02, VPCD-98-15, and CCD-00-10 clarifying its policies to ensure safety of ORVR systems. Further, 40 CFR 86.1810-01(a)(2) prohibits manufacturers from using emission control systems or components which result in unsafe conditions. To comply with sections 202(a)(4) and 206(a)(3) of the Act, manufacturers have submitted Statements of Device Safety in their applications for certification. This letter modifies earlier guidance in CCD-00-10, simplifying reporting guidance.

New Guidance on ORVR Review of CNG and LPG Vehicles

*LPG Vehicles:*
When a vehicle with a previously reviewed gasoline ORVR system is converted to dual fuel gasoline/LPG operation the manufacturer or converter should supply the following information:

1) The model year, make, model, engine family or test group, of the vehicle to be converted.
2) A statement indicating whether on not the current gasoline ORVR system will be left completely intact. If the gasoline ORVR system is modified, supply a list of the modifications. A modified ORVR system will require more extensive review by EPA in consultation with NHTSA.
3) A statement indicating whether or not the LPG fuel system is a closed system. If the fueling system is a closed system, the vehicle owner's manual should make clear that an outage valve, if present in the LPG fueling system, is not necessary for refueling.

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[3]Federal Register Vol 59 No. 182 Wednesday, September 21, 1994 Standards for Emissions From Natural Gas-Fueled, and Liquified Petroleum Gas-Fueled Motor Vehicles and Motor Vehicle Engines, and Certification Procedures for Aftermarket Conversions-Final Rule

4) A statement whether or not the LPG fuel system is designed and installed properly, and the basis for asserting proper design and installation, e.g. NFPA 58 guidelines.

In the case of a vehicle designed to operate exclusively on LPG, the converter should supply the information in items 1, 3, and 4 above.

LPG vehicle manufacturers who require a refueling loss control system to comply with EPA standards will continue to need to obtain EPA approval of their systems (in conjunction with NHTSA) prior to issuance of a certificate of conformity.

*CNG Vehicles:*
When a vehicle with a previously reviewed gasoline ORVR system is converted to dual fuel gasoline/CNG operation the manufacturer or converter should supply the following information:

1) The model year, make, model, engine family or test group, of the vehicle to be converted.
2) A statement whether or not the current gasoline ORVR system will be left completely intact. If the gasoline ORVR system is modified, supply a list of the modifications. A modified ORVR system will require more extensive review by EPA in consultation with NHTSA.
3) A statement whether or not the vehicle is equipped with a receptacle that meets the current accepted requirements of the ANSI/AGA NGV1 standard for CNG refueling couplings.
4) A statement whether or not the CNG fuel system is designed and installed properly, and the basis for asserting proper design and installation, e.g. NFPA 58 guidelines.

In the case of a vehicle designed to operate only on CNG, the converter should supply the information in items 1, 3, and 4 above.

The information above should also be supplied to NHTSA, to the attention of:

Scott B. York - Mail Code NSA-122
U.S. Department of Transportation
National Highway Traffic Safety Administration
Office of Defects Investigation
400 7th Street, S.W.
Washington, D.C. 20590

202-366-5209 (voice) 202-366-1767 (fax)

Submitting this reduced set of information will expedite the ORVR review time, which is an element in approving the application for certification. This guidance is effective immediately, and applies to aftermarket converters and OEMs who supply dual fuel and dedicated alternative fueled vehicles.

Background on Gasoline ORVR Testing Waivers for Aftermarket Conversions

The September 21, 1994 gaseous fuel regulation allows the use of testing waivers for CNG and LPG evaporative and refueling emission testing[4]. The August 29, 2002 EPA guidance letter[5] discussed test waivers for vehicle conversions to alternative fuels. Attachment 2 to that letter, Test Requirements for Alternative Fuels Converters, described the conditions under which EPA will grant test waivers from gasoline evaporative emission testing for dual fuel vehicles. The guidance letter did not explicitly address test waivers from gasoline refueling emission tests when vehicles were modified for dual fuel operation.

New Guidance on Gasoline ORVR Testing Waivers for Aftermarket Conversions

EPA's policy on gasoline ORVR testing waivers should be consistent with the policy on waivers from submitting evaporative emission data. Therefore, waivers from submitting refueling emission data require the converter not to modify the OEM gasoline refueling emission control system and not to increase the weight of the vehicle by more than 500 pounds. This is consistent with EPA Advisory Circular 64, which describes EPA's policy on making minor modification to a certified light duty vehicle or truck. A statement which attests to meeting the conditions presented above should be included in the application for certification. Similar to the waiver policy on gasoline evaporative emission testing, converters are still responsible for meeting gasoline ORVR requirements and passing confirmatory refueling tests which EPA may conduct.

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[4]Federal Register Vol 59 No. 182 Wednesday, September 21, 1994 page 48477

[5]CCD-02-12 Certification Guidance for Alternative Fuel Converters, August 29, 2002 Certification and Compliance Division, Office of Transportation and Air Quality